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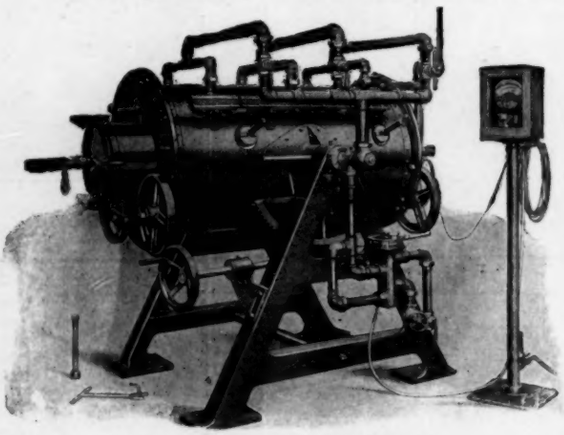
FURNACES AND EQUIPMENT FOR EVERY INDUSTRIAL PURPOSE



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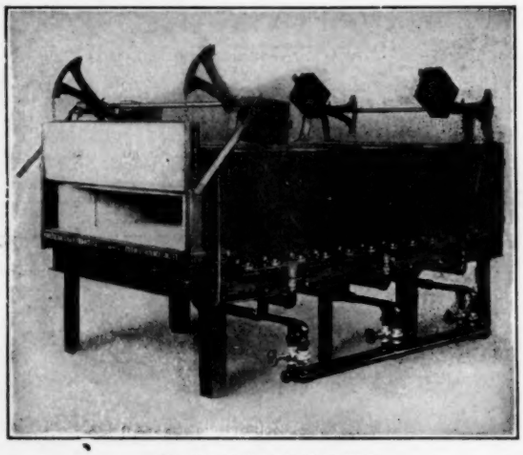

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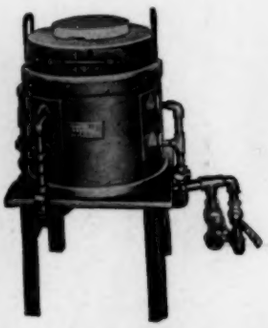
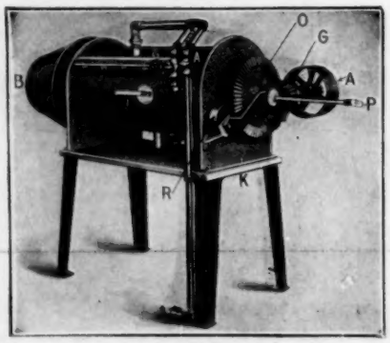


No. 12 CYLINDRICAL FURNACE

For hardening high speed steel such as drills, reamers, etc.

Made in many sizes.



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American Gas Journal

SIXTY FIFTH YEAR

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ISMAR GINSBERG, Technical Editor

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What I Have Learned in Twenty Years Selling Gas Appliances

As told by a successful appliance department manager to

Frank H. Williams

IN selling appliances to homes it is always the women of the homes who must be sold, rather than the men. The average man spends only about a fourth or fifth as much time in his home as the woman does. So he doesn't feel the need of gas appliances the way the women do. Consequently, if we can get the interest and attention of the women, we do not have to bother much about the men, because the women will see to it that the men provide the money with which to make the purchases.

The Influence of Style

Though it might not look so on the surface, the fact of the matter is that style is of tremendous importance in influencing women for or against new gas appliances. If a woman can be shown that the appliances she is using are no longer quite the latest thing in style, judging by what the women in her neighborhood are buying and using, then she feels a strong impulse to buy the new things. She wants to have the new gas appliances in her home, so that, when her friends and relatives come to visit her, she can take them around and show them the new things and comment on the fact that her home is right up-to-the-minute in the matter of gas appliances. Time and again it has been found that it is possible to put over sales by talking up the style of gas appliances where no sales at all could be made when using other methods.

Women Read Advertising Copy

Women like a lot of copy in the advertisements they read relating to gas appliances. They want to know all about the appliances; they want to know all about the various methods of paying for the appliances on the installment plan; they want to know about other people who have bought the appliances and who are using them and they want to do quite a lot of reading about all the appliances before purchasing them. That, at least, is the conclusion that has been reached after twenty years of experience in the selling of gas appliances. It has been noticed that the more extensive and comprehensive the advertising was that was used, the more effective such advertising was in creating interest and in making sales. Perhaps my experience along this line is unique and perhaps this condition of affairs is entirely or almost entirely due to local conditions.

Do Not Become Facetious in Selling Gas Appliances

It has been found that it never pays to get humorous or funny in selling gas appliances. This is due to two things. First, the average woman has little or no sense of humor. Second, even if the prospect does not have some sense of humor, the purchase of gas appliances is a mighty serious proposition with her and she does not want it treated in a light way or funny way by the company from which she is making the purchase. It may help things along in some lines of business to tell prospects funny stories or to "kid them along," but such methods are simply fatal when trying to sell gas appliances. Constant seriousness and the constant treating of the sale as though it is the most important thing in the world is the best way of getting the woman's attention and interest and of closing the sale.

Value of Demonstrations

Demonstrations are the quickest and most effective method of getting the interest of women and of discovering new prospects. Among the demonstrations that may be staged are showings of the speed with which appliances work, the splendid charac-

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The Rotary High Pressure Blower

Its historical development, design and characteristics

E. Dwight Johnston

President and General Manager, the P. H. & F. M. Roots Co., Connersville, Ind.

IN DEALING with this subject it is advisable briefly to review the history ot the rotary positive displacement pumps. In the early part of the seventeenth century, a man named Serviere designed a rotary pump having six lobes similar to the teeth of a gear. This design is closer to the present type of machine than any other of the early efforts in rotary construction. During the eighteenth century and the first half of the nineteenth century, various forms of rotary pumps and engines were designed, quite a number of which were of the two and three lobe type. Some of these were of the intercepting blade type, such as the old Baker machine, and some were of the sliding vane type, such as the Makenzie.

Present Development of Rotary Pump

The present development of the rotary pump has been confined to a rotary unit in which the impellers are symmetrical about two axes set at right angles to each other, the lobe of one passing through the throat or waist of the mating impeller. In the development of the rotary machines, it appears that the pump and engine antedated the blower, because the blower seems to have been an off-shoot of the other line of development.

First Blower Built for Cupola Service

The Roots blower was itself directly responsible for an attempt to build a water motor by the Roots Brothers, who owned and operated a woolen mill at Connersville, Indiana, prior to the time they began building blowers. This water motor was intended to operate their mill, but, being constructed of wood, it naturally swelled on being put into use. It was taken to a shop where the interference of the rotors was relieved and the unit was then belted to a line-shaft for a test of its running qualities.

A foundryman, standing close by, noticed the current of air developed by the machine, and finally induced the Roots Brothers to build him a rotary unit of this type for cupola service. This first attempt proved a success and was the foundation of the rotary blower and gas pump business of today.

Changes in Original Design

With one or two exceptions, the characteristics of the original Roots blower have been adopted as the best and simplest form of the rotary machine to date. The development has been very gradual. The changes deal largely with mechanical detail and shop convenience. As improved machinery, capable of more accurate work, was placed on the market, slight changes in the impeller forms have been made to take advantage of the chance to improve the efficiency by closer machine work. From a machine having a fair efficiency at a pressure of 1 lb., units can now be operated at pressures of 8 to 10 lbs. with an efficiency which compares favorably with the best design of compressor units.

General Design

The general design of rotary units is much the same; different manufacturers have developed different forms of impellers and various methods of mounting the impeller on the shaft, and possibly the greatest difference at present lies in the design of the bearings. The machines are constructed either of the vertical or horizontal type. A vertical machine has side inlet and outlet, while the horizontal machine has the inlet at the bottom and the outlet at the top, or the reverse. Top discharge machines of the horizontal type, however, have the preference.

Vertical Type of Blower

The vertical type has some advantage in piping layout, but the horizontal machine is much more rigid and therefore capable of running at higher speeds, which gives better efficiency. The rotors with their shafts and gears constitute the only moving members. The gears serve the purpose of keeping the impellers in their proper relative position. With either the horizontal or vertical machine, gears may be placed at either one end or at both ends.

Both Types Used in Low Pressure Service

For low pressure service, both the horizontal and vertical type are used, but the advantages of the horizontal machine are becoming so widely known that comparatively few vertical units are now used. For high pressure work, the horizontal unit is always specified and, as a rule, this type is furnished with a single set of gears and the shafts are extended beyond the gears and carried by double outboard bearing, which insures greater rigidity and better alignment of the shafts for protection of the gears.

The Driving Unit

The driving unit can be attached either at the end of the rotary unit carrying the gears or at the opposite end. Operators as a rule prefer the timing gears located at the end opposite the prime mover, due to the fact that with this design, adjustments and replacements can be made more easily and conveniently. Any misalignment of the shafts caused by changing position of the prime mover has the minimum effect on the gears when they are placed at the end opposite the prime mover. When the gears are placed opposite the driving end, no appreciable distortion will result providing the shafts are amply designed for strength. It is necessary in this type of unit to use shafts designed to carry the flexure and shafts so designed are amply strong in torsion.

The Bearings

The bearings may be either of the half box or quarter box type. The former as a rule are provided with adjustments in the vertical plane only, while the latter are designed to accommodate adjustments in both the vertical and horizontal planes. Simplicity of design is the keynote in bearings and heavy sections are used throughout to eliminate vibration. With half box bearings, the bearing surface may be either babbit or bronze. Where babbit is used the metal is usually set in a cast iron box and accurately bored.

The lower cast iron housings are carried in the headplate casting and the upper cast iron portion, usually termed the cap, is secured to the headplate casting in a manner which permits its adjustment and ready removal. The lower cast iron box part is held rigidly in a machined recess of the headplate casting, so that it cannot move in the horizontal plane. Its vertical adjustment is possible through a wedge of simple design.

The lubrication of bearings is effected by means of chains or rings which carry oil from a reservoir located in the lower cast iron box.

Efficiency of Rotary Blower

The volumetric efficiency of the rotary unit depends upon the clearances. With a unit in proper adjustment the rotating members have no actual mechanical contact either with each other or with the case. Due to the separation of these parts, a certain amount of slippage takes place which varies directly with the area of the clearance opening. The clearance, therefore, should be kept as low as is consistent with safe operation.

Naturally small machines can be operated on closer clearances than large ones, but the loss in large units s less, because the slippage area is very small compared with the total cross-sectional area of the case, which determines the total capacity of the unit.

The slippage through the clearance spaces depends upon the differential pressure between inlet and outlet and also upon specific gravity of the fluid being handled. Due to improved shop facilities and the accompanying better workmanship which is possible, clearances have been reduced very materially and have resulted in a direct increase in volumetric efficiency for the rotary unit.

Volumetric Efficiency Increases With Speed

Due to the fact that the loss through the slippage areas is constant for a given pressure and specific gravity, it follows that the volumetric efficiencies for any given unit will increase as the speed is increased.

The mechanical efficiency is comparatively high, because the only points of friction lie in the bearings and in the gears. With proper lubrication, the friction loss need not exceed 8 per cent on smaller units and it is not uncommon to find losses as low as 3 to 5 per cent on larger units.

Speed of Operation

The passage of larger volumes in a given time for a certain unit decreases the percentage of slippage in an inverse ratio as the revolutions per minute are increased. In addition, due probably to eddy currents which are set up by the rotation, the efficiency increases more rapidly than the increase due to speed ratio alone. A speed could be reached, however, where the velocity of the flow of the gas would be so rapid that wire drawing would take place and the efficiency curve would begin to fall, but since this point is beyond the safe speed of the rotary unit, it is correct to say that the efficiency increases with the speed.

Conditions Determining Speed of Unit

The conditions of operation have often more weight in determining the speed of the unit than the mechanical details concerning the operation of the machine. While it has been shown that higher speeds will give higher volumetric efficiencies, we must not lose sight of the fact that a given amount of material and a certain amount of workmanship have a definite life which can be consumed in a comparatively short time by operating at high speeds. Conservative speeds are especially desirable on gas pumping rotary units, due to the fact that any tendency for vibration at once causes stuffing box leakage.

Methods of Drive

The first rotary units were designed for belt drive. As larger units were constructed an individual prime mover was applied to each rotary unit as a rule in the form of a reciprocating engine, either of the horizontal or vertical type. Naturally many different methods of drive have been attempted. Early in the manufacture of this type of equipment, it was realized that if the power could be applied to each shaft the wear on the gears would be very materially reduced.

Following the attempt to drive by two belts, units were designed and built for a double engine drive. One design included a vertical engine, mounted integral with the headplate casting of the blower and arranged with two connecting rods attached one to

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The Legislature Again on the Rampage

A new municipal ownership bill introduced in Albany

Don Holbrook

THE Public Utilites Control bill, which was recently introduced at Albany, amends the general city law in relation to ownership, establishment, construction, acquisition and operation of public utilities. The first part of the measure provides workable machinery for acquisition of utilities. The last part of the measure, which describes the method by which such plan is to be put into operation, pictures as weird a scheme of finance as narrated by Mark Twain in "Roughing It," where, in the building of a railroad, the franchise was mortgaged to build the track, the track to buy the equipment, the equipment to build the stations, and the stations to pay the help.

The Financial Part of the Plan

The average corporation granted a franchise, adequately capitalized, with a plant, equipment, facilities and a going business, is ready to meet the public. Not so the municipally owned or operated public utility under the terms of the new measure. Under the financial plan proposed, the city would provide not only the purchase money for the equipment, plant, facilities, etc., but it would also provide a fund sufficient to pay the operating expenses, including the wages of all employees, for the first six months of operation of the utility, and apparently after that, if sufficient money were not forthcoming from the receipts obtained from the public.

A Separate System of Accounting for Each City

For ten years utility corporations have been trying to get a uniform system of accounts adopted, and such a system patterned after the plan of the National Association of Railway and Public Utilities Commissioners, has recently been put into effect in this state for the keeping of accounts of gas and electric corporations, by an order of the Public Service Commission. The new bill would allow each city to put into effect its own system of keeping accounts, which might be different for each utility operated or regulated and a perfect hodge-podge system of accounting would be the ultimate result.

Making Good the Deficiencies

Subdivision 8 of Section 26-D reads, in part: "Should the aggregate revenue earned in any month by any such utility or system of utilities not be sufficient for the payment of the expenses of operation and maintenance thereof, exclusive of charges for depreciation, interest and amortization, the municipal operating agency shall forthwith report the facts to the local appropriating body, which shall immediately take action thereon, either to provide funds to supply such deficiency in revenues, or to suspend such municipal operation. * * *"

At the present time a public utility declared to be a necessity cannot on its own motion suspend operations even if running at a loss without a court order and the usual process is not to deny the public of the necessity but to operate the utility through a receiver, granting it such relief as is possible in the way of fares, rates, conditions and charges. The Legislature, under the terms of the proposed bill, delegates absolutely to the cities the right to take over utilities and to operate them, which carries with it the right to cease operations, and in the case of any such operation so discontinued, if the above language were sustained. It is extremely doubtful if there is anyone who would have the right of action to go to the courts and compel a continuation or resumption of operation of the utility whose service had ceased or would there be a court, unless it did so by main strength, which would have the jurisdiction to issue an order compelling resumption of service.

People to Pay for Experiment

It is further provided that if, at the close of any fiscal year, there shall remain a deficit, and there be not sufficient accumulation of funds in the capital reserve fund to provide for the payments on account of interest and amortization, the local appropriating body shall thereupon appropriate an amount sufficient to supply the deficiency and make the payments required.

Not one word is said about rates being based on a fair and reasonable return on capital invested or for an increase in rates if at the end of a year of operation it is necessary to make up a deficit.

It is also provided that the expenses of a city for the establishment, construction, acquisition, enlargement or equipment of such city utility or system of like utilities may be provided either by taxation or by the issuance of bonds, or by both, as the local appropriating body may determine. Bonds, if issued, are to be issued in such manner and form as provided by the local charter, are to bear interest at such rate as may be determined by the appropriating body, are to run for the estimated life time of the

(Continued on page 222)

GAS MERCHANDISING

Domestic – Industrial

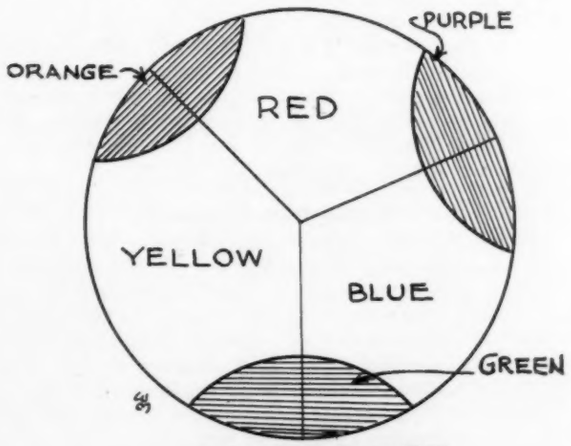
Ideas for the Window Trimmer

Contrast—Color—Motion

William H. Matlack

Someone has said, "get action into your window displays," and another window decorator says, "Arouse interest in your window displays by contrast; build for beauty by proper color combinations."

We believe what both say. We believe color and motion, separately, or combined, will attract attention and arouse interest if properly utilized and combined. Color must be handled carefully; use discretion in its employment. While we do not pose as an authority on color, we are not of the opinion that



COLOR CHART

"any color may be used, just so it is red." Red, of course, attracts because it is a warm color. It indicates heat, force and power, also excitement. It is said that a certain chain store uses red because it produces action. There is a tip. Happy combinations, as we see them, run something like this: black and white, black and orange, red and white.

Combinations and Contrast of Colors

To achieve the combination, the contrast you desire, study the color chart shown here and study the combinations of these colors. If you want to appeal especially to women, use pastel shades. They are delicate and suggest feminine charm and arouse feminine interest.

Study color harmony. Merchandise should harmonize with the colors selected for its setting. All drapes, covers and show cards should harmonize with the appliance displayed. Here is one way to work out colors for use in window displays: Winter calls for heat—use red; home-baked pies call for an appetizing color—use yellow. Red may be combined with yellow for fall displays. When summer is the keynote of the "picture," use green; it is cooling as well as restful to the eye. There is something immaculate about blue; blue is an attribute of cleanliness; it is a clean color. Why not use it in connection with the all gas kitchen display or the gas for fuel, "free from dust and dirt."

Study Color

As indicated by the chart, the primary colors are red, yellow and blue, and the secondary colors are orange, green and purple; combinations thus go on and on. If you are particularly interested, visit the public library in your vicinity and procure a book on color. You will find it a big subject.

Note—It has been said that women prefer red (action), while men prefer blue (cleanliness), so why not work out displays bearing these facts in mind and direct our appeals to women through action and those to men through cleanliness.

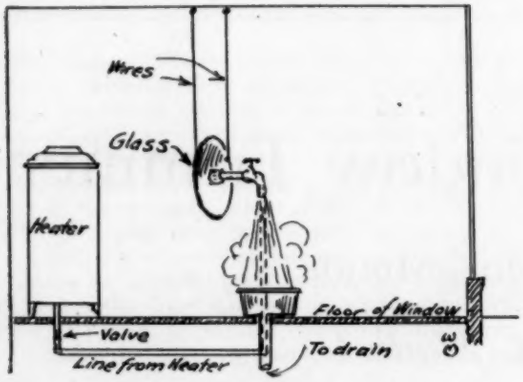
Get Attention Through Action

Now, for those who want to get action into their

windows, here is a little sketch which is self-explanatory:

A mysterious faucet:

1. Connect an automatic water heater.
2. Run a line from the hot water supply line down under the floor of the show window with an ell looking up into the pan on the floor.



Where does it come from?

3. From the ell, extend a glass tube up into the mouth of the faucet.
4. Faucet to be attached to a piece of glass suspended from the ceiling by wires.
5. Pan to have a hole in the bottom to which the pipe has been soldered to drain water to sewer.
6. Use thick glass tube and run water steaming hot for a most resultful display.

WHAT I HAVE LEARNED IN TWENTY YEARS SELLING GAS APPLIANCES

(Continued from page 215)

ter of the work appliances do, the ease of operation and the latest ways of operating appliances. To these demonstrations it is well to invite all the women of the city. These invitations are extended by means of newspaper advertising, by means of cards which are distributed to all the people who come into the store and by means of telephone calls and printed invitations which are mailed to the people who are wanted to come into the store. All of these various methods are extremely successful with us in getting women into the establishment. Once the women are in the store the demonstrations arouse their interest and then by means of personal talks with the women it is possible to ascertain which of them are good prospects.

Women Like Personal Attention

Women like personal attention from folks more than men. For instance, a woman appreciates it highly when her face and name are remembered and when she is spoken to directly when she comes into the place of business to pay her gas bill or to look at appliances. Also, if the fact is recalled that an appliance has been sold her and she is asked how she is getting on with the article, she is much pleased and more friendly. In view of all this, it is advisable to remember names and faces as far as possible and also to be friendly to all the women who come into the establishment. This thing of being friendly to the women and chatting with them is immensely helpful in getting the interest and attention of the women and in making many sales which, otherwise, would probably never have been made.

The Value of Personal Service

It always pays to see to it that, when a gas appliance is purchased by a woman or installed in a home, the woman who is going to use the appliance is fully initiated into its uses. Upon analyzing the various complaints which arise from time to time the fact is developed that the great majority of the complaints are due to the fact that the women using the appliances have not known just how to use them. If they had known all about the appliances of which they are complaining there would not have been any complaints. It is well to go into their homes and spend hours with them, showing them just how to light a gas heater and just how to use this, that or the other appliance. In fact, a lot more time is spent in this sort of thing than could be justified if it was not for the fact that by this method complaints have been cut down to practically nothing at all.

Appliances Can Be Sold on Any Day of the Week

There is no particular time of the day when housewives are too busy to talk to house-to-house sellers of gas appliances, provided the salesman has something interesting to say and knows how to say it. The women may be busy with her washing or she may be in the midst of getting a meal for her hungry children, but she will stop and listen if the salesman is short and to the point and if he says something which strikes home at her. This has been proven by actual experience which has shown that it is no trick at all to sell gas appliances on Monday mornings any more than it is a trick to sell them on other mornings in the week. But, of course, it is only the particularly good house-to-house salesmen who can do this sort of thing. The average salesman, who gets by only with difficulty, had best not try to sell goods on Monday morning.

Getting New Prospects

It pays immensely in creating good will for the gas company and in finding out new prospects to keep a list of the people who have purchased gas appliances and then to go around and call on them every now and then and ask them how their appliances are getting along and whether or not there are any minor adjustments or repairs which should be made. This sort of thing makes quite a hit with the women and makes them feel that the gas company is a good concern to deal with and so makes them more eager to buy additional goods and also to furnish the names of live prospects.

It is always a good plan to get records of new meter installations from that department and then to call on these people and sell them gas appliances because new installations are generally in new homes and the folks moving into new homes are generally in the mood for buying new and up-to-date things for their homes.

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 10

Absolute Temperature

What Is Absolute Temperature?

It will be remembered that the scientist, Fahrenheit, in developing his temperature scale, thought that his zero was absolute zero, or in other words the most intense cold that could be produced. At his time this was true enough, but scientific developments have since shown that much lower temperatures can be obtained than zero degrees Fahrenheit.

It must be understood that degrees cold are just as relative as degrees heat. In other words, ice is cold. But when a cake of ice placed in a room which has a temperature of ten degrees below zero Fahrenheit, for example, the ice will actually tend to assume the temperature of the room. It will truly give up heat to the air in the room, with resulting drop in its own temperature, until a point is reached where it has the same temperature as the air of the room. The ice has then no longer a temperature of 32 degrees Fahrenheit, but one somewhere in the neighborhood of 10 degrees below zero on the Fahrenheit scale. It is clear from this example that cold is just as relative a term as heat and that ice is not by any means the coldest substance known.

Zero Temperature Does Not Mean Zero Heat

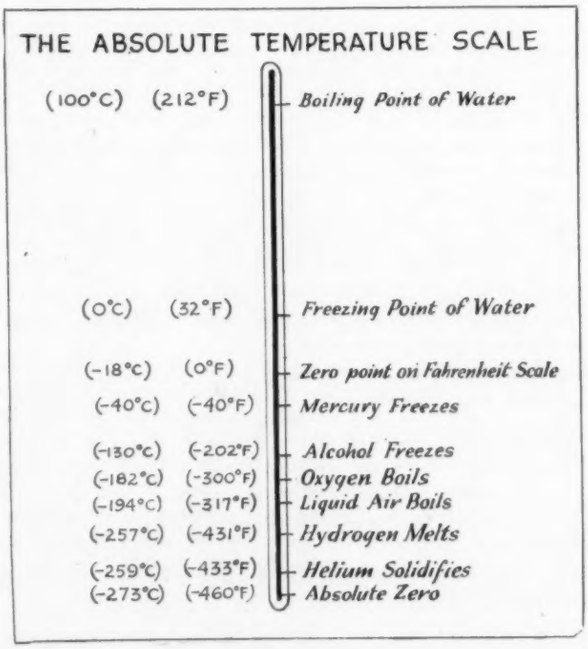
Therefore, the zero temperature on the Fahrenheit and the Centigrade scales does not infer total lack of heat, as might be imagined from the very term, zero. These points were marked zero for the sake of convenience and not to denote that the body that reaches that temperature absolutely loses all of its heat.

The variation that can take place in the temperature of the air brought about by natural causes is not very great. In some climates the temperature may fall 40 or 50 degrees below zero on the Fahrenheit scale and in others rise to 110 or 120 degrees in the heat of the summer. Most substances do not change their state within these temperatures, that is, solids do not generally become liquids; liquids, gases, or, vice versa, gases, liquids, and liquids, solids, within the range of atmospheric temperatures.

It has been said that gases contain the most amount of heat for at one time or another a comparatively large amount of heat had to be supplied in order to change the substance into the gaseous condition. Most gases remain gases within the range of atmospheric temperatures, no matter how low the temperature may fall, for it cannot fall low enough to bring about a change of state. But, when the temperature is lowered far enough, the gases will condense and form liquids, and even congeal into solids. It is in the work of liquefying and solidifying gases that the maximum low temperatures are obtained.

Low Temperature and Pressure

In producing low temperatures it was noted that when pressure was applied to the gas, its liquefying


THE ABSOLUTE TEMPERATURE SCALE
(100°C) (212°F) Boiling Point of Water
(0°C) (32°F) Freezing Point of Water
(-18°C) (0°F) Zero point on Fahrenheit Scale
(-40°C) (-40°F) Mercury Freezes
(-130°C) (-202°F) Alcohol Freezes
(-182°C) (-300°F) Oxygen Boils
(-194°C) (-317°F) Liquid Air Boils
(-257°C) (-431°F) Hydrogen Melts
(-259°C) (-433°F) Helium Solidifies
(-273°C) (-460°F) Absolute Zero

temperature was raised, which made it possible to liquefy the gas without the application of the intense cold that is required to cause the change from gas to liquid under ordinary atmospheric pressure. The same condition applies to the conversion of the liquefied gas into a solid. For example, the gas, sulphur dioxide, which is produced by burning sulphur and

which has many technical and industrial uses, is changed into a liquid at a temperature of 12.6 degrees Fahrenheit. However, by the application of a little pressure it can be condensed, even at the ordinary air temperature. The cold produced in this way can be used to liquefy a gas which has a still lower boilng temperature, such as carbonic acid gas. The process can then be repeated, so that finally the gases that are very difficult to liquefy, such as hydrogen, oxygen and air, are changed into liquids and even solids by the simultaneous application of great pressure and great cold. Thus, for example, the gas hydrogen solidifies at a temperature of 432 degrees below zero, Fahrenheit. The gas helium, famed for its use in inflating airships to avoid the danger of explosion which is always present when hydrogen is employed, liquefies and solidifies at a lower temperature than any other known substance. This extremely low temperature is, however, still somewhat higher than the absolute zero.

The Definition of Absolute Zero

To understand what is meant by absolute zero, it is necessary to know clearly what happens to a gas when the temperature is increased while it is kept under a constant pressure. It has already been mentioned that the application of heat to solids, liquids and gases generally causes them to expand. It always has this effect on a gas. Thus, if a known volume of any gas, say hydrogen, is subjected to a reduction in temperature of one degree Centigrade, it will be found that the volume of the gas has been correspondingly reduced by one two hundred and seventy-third. On the other hand, if the temperature of the original gas is reduced one degree Fahrenheit, it will be found that the volume is similarly reduced by one four hundred and sixtieth. This holds good for any gas. The loss or reduction in volume is the same for all the known gases, at least, it is so nearly so that for practical purposes it can be assumed to be constant. It is understood that the rise in temperature of a gas will cause a similar increase in its volume.

As the temperature of the gaseous volume is reduced, it is conceivable that at a point 273 degrees below zero C., or a corresponding point of 460 degrees below zero F., the volume of the gas will become nil. A numerical example will illustrate the correctness of this hypothesis. Thus, if we start with one cubic meter of hydrogen at zero degrees C. and reduce its temperature one degree, we will have left a volume which may be found from the following equation:

$$1 - \frac{1}{273}$$

. It is easy to see that if the temperature were reduced to 273 degrees below zero on the Centigrade scale, then the volume of the gas would be equal to $1 - \frac{273}{273}$ or zero. The same reasoning is used when Fahrenheit degrees are employed, only in this case the temperature will be reduced to 460 degrees below zero on the Fahrenheit scale. Thus the volume of the gas mathematically becomes equal to zero. Whether this will happen or not cannot be told since, while absolute zero—as the temperature 273 degrees below zero on the Centigrade scale, corresponding to 460 degrees below zero on the Fahrenheit scale, is called—has been approached (the gas helium will solidify at minus 267 degrees Centigrade or minus 433 degrees Fahrenheit), nevertheless, it has not been attained.

Importance of Absolute Zero

The importance of absolute zero, which, at first glance, seems to be of theoretical value only, is in connection with calculations of the change in volume of a gas that takes place when the temperature is raised or lowered. The volume varies not with the ordinary temperature of the gas, but with the absolute temperature. This is a matter that must be left for later discussion. It will only be mentioned here that this particular gas law, which is much used by the gas engineers, is known as Charles' law in England and as Gay-Lussac's law in France, it having been simultaneously discovered by these two investigators.

THE LEGISLATURE AGAIN ON THE RAMPAGE

(Continued from page 218)

improvement and are to be payable in gold. Each particular utility financed is to be backed by a separate series of bonds. All such bonds shall be exempt from taxation and shall be a legal investment for the sinking fund of the city and for trustees or other fiduciaries charged with the investment of trust funds and may be deposited as security under contracts with the city in lieu of deposits of money, surety bonds or other security.

Act to Take Effect at Once

The act would take effect immediately and under its provisions it is included that "No provision of any law, whether general, public, private, or local, inconsistent with the provisions of this act, shall have application to any city utility.

The date of a public hearing on this measure will be announced soon and after such hearing there will perhaps be some minor amendments, that is, if anyone can think of additional bedeviltry not already included in the original act. Heralded as a simon pure home rule measure for public utility regulation, in reality it typifies public utility anarchy, for it gives the right to the municipality to tear to pieces the existing structures of public utility corporations, and if they cannot be operated satisfactorily, to abandon the utility, depriving the people of service and the original investor in the securities of the utility of not only income, but principal, and yet there are thousands of people who believe this is sound doctrine and were the Legislature of administrative complexion in its entirety the measure would be passed immediately; as it is, there is danger that some sort of bill as a compromise measure along these lines may get onto the statute books.

As The Journal Views It

THE HARPY'S CALL, MUNICIPAL OWNERSHIP

The newest development at Albany is the entrance upon the scene of the long heralded public utility control bill. In another part of this present issue there is given a detailed review of the terms of this bill, which is of the greatest importance to the public utilities throughout the state, and particularly to the gas industry.

That such a bill should be introduced in the Legislature and taken seriously by Senators and Assemblymen who are supposed to legislate for the best interests of the people, is really a commentary upon the way in which our state government is conducted. The worst feature of the whole blll is the manner in which the financial end of the proposition is to be managed.

It is stated that "the expenses for the development, construction, acquisition, enlargement or equipment of systems of public utilities may be provided either by taxation or by the issuance of bonds, or by both, and that all such bonds shall be exempt from taxation. The capital for the initial operation, etc., is to be paid from the proceeds of the sale of revenue bonds, and if at any time the revenue from the utility operated by the city is not sufficient to pay the expenses of operation, maintenance, etc., more bonds are to be issued by the city authorities to take care of the same, and the principal and interest thereof are to be paid out of the tax levy of the next year."

According to the bill, then, the people are to pay for whatever deficiencies are incurred in the operation of the utility.

It is inconceivable that the public should be fooled by a bill of such a nature. Of course, there are certain groups that would welcome municipal or state ownership of public utilities, no matter if the people had to pay twice, or three or four times as much for their service as they are paying now. The only idea in these people's minds is to have the state own the utilities, and once they have gained that end they are no longer concerned with the matter and they do not care how much the public will have to pay for such an adventure. It is very likely that once they were themselves confronted with increased rates for gas, electric, transit, etc., these very advocates of government ownership would howl for dear life and be most active in urging a quick end to the experiment.

But the people of the state cannot afford to let these small groups have their way, they cannot afford to allow them to experiment with the people's money, and with their very safety and convenience, as the present bill wishes to do. It is out of the question that the gas industry and the other public utilities of this state should permit this bill to become a law without voicing every possible opposition to it, and without calling the attention of their customers to the vicious character of this measure.

It has been heralded as the real Home Rule Measure for public utility legislation, and it gives each and every city the right to destroy the present system of public utility organizations, and to substitute therefor a plan which will undoubtedly cause the citizens of the state the loss of considerable money and put them to all sorts of inconvenience and difficulties.

For there is no doubt that any city which will take advantages of this measure and arrange to acquire its utilities will find to its sorrow that it will have to abandon them because of the fact that it cannot run them advantageously, and, once abandoned, they will probably be mere wrecks of the systems that were built up by private enterprise. This bill should not be left unanswered and it behooves every gas man to see that the public understands its real significance.

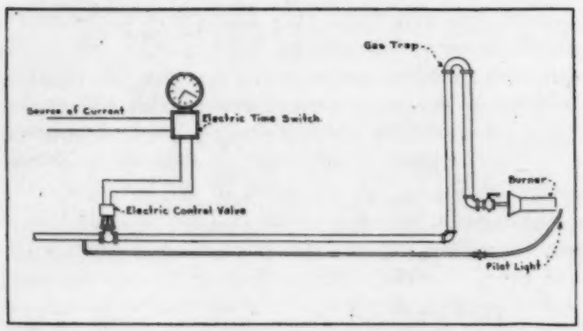
GAS WRINKLES

GAS TRAP FOR REMOTE AUTOMATIC CONTROL TO GAS BURNERS

F. H. Pelle, San Francisco, Cal.

In order to prevent the gas in the line, between an automatic control valve and the burner of an appliance, from gradually escaping and allowing air to enter the pipe this gas trap was installed immediately ahead of the burner.

This is particularly desirable where the burner is some distance from the automatic control because without the trap the gas contained in the pipe between the burner and the valve is replaced with air after the valve has been shut off for several hours and when the valve is again opened this air is blown through the burner, extinguishing the pilot, or, if the gas in the pipe between the valve and the burner is only partially mixed with air an explosive mixture is sometimes obtained which explodes when the valve is opened, which also has a tendency to extinguish the pilot light and cause the burner to back fire.



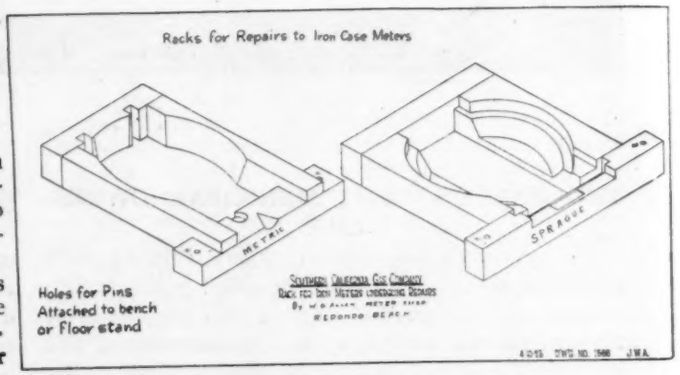
RACK FOR IRON CASE METERS UNDERGOING REPAIRS

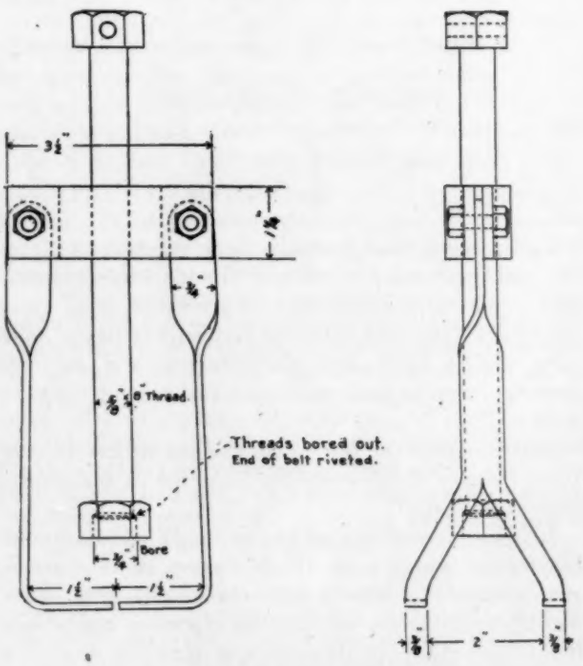
W. G. Allen, Redondo Beach, Cal.

This rack or jig is fashioned out of hard wood so as to conform to the shape or contour of an iron case meter and is securely fastened to a floor stand or a lower portion of the work bench.

When the meter is placed in this rack it is laid firmly in a position most convenient for making repairs and it is not possible for it to move about while the screws are being put in or taken out, therefore reduces the danger of the screw driver slipping and injuring the workmen.

The accompanying sketch shows racks for Sprague and Metric meters.





Valve Packing Gland Puller

W. Volk, San Diego, Cal.

Catechism of Central Station Gas Engineering in the United States

Installment No. 10

(Continued from last week)

This tool is used as the first and only tool in cleaning pipes from hard stoppages that are not bad, and to follow the cutter in the case of pipes in which the carbon has been allowed to grow thick. The largest size is of such a diameter that when it has cut its way down a pipe the ring will follow easily.

The Ring

Ring: Made of ⅜-inch x 2½-inch steel, drawn to an edge, as shown on drawing. To it are riveted four ⅝-inch rods, welded together at their other ends, the single rod thus formed being welded to a piece of ¾-inch pipe, long enough to allow the ring to drop to the bottom of the longest stand-pipe.

This ring is used merely to detect the presence of any lumps that the "Star" may have slipped by, and is not used to cut away obstructions of any size. It is made from ¼-inch to ⅜-inch less in diameter than the pipes on which it is to be used.

Augers

Augers: Made from steel blanks 3/16-inch thick, and of shape and size shown on the cut. Welded to rods 11 feet long, 7 feet at handle end of which is ¾-inch round and the rest ⅝-inch round iron. These rods have eye handles and are curved, as shown. The auger heads are given at least one full turn, and preferably more. The augers are used to clean the lower portion of the stand-pipe at each draw. Similar heads are fixed on pipe handles for use in cleaning the pipe from above in case of a lamp-black or other soft stoppage.

Basket

Basket: It sometimes happens that a pipe is allowed to run so long, or is so handled when the cleaning is begun, that it becomes completely choked up with carbon so hard that it is almost impossible to drive even a pointed bar through it. It is for such cases that this basket is useful. It is made of a piece of perforated iron, cut from a sheet discarded from a rotary coke screen; is open on one side where it abuts against the front wall of the stack, and the bottom has an opening cut far enough back to take in the stand-pipe. A pair of tongs with clamping ring clutches the stand-pipe and supports the basket at the proper height.

Its use is as follows: In the case described above, the obstruction is located and the point marked on the outside of the pipe. The tongs are then clamped on at the right place, the basket hoisted up and placed upon them, encircling the pipes and touching the front wall of the stack. A wood fire is started in the basket and kept up until the heat softens the obstruction sufficiently to allow a fair-sized opening to be made through it, when it is permitted to die out and the pipe burnt clean in the regular way.

Note.—The dimensions given on all cuts are for tools to be used in 6-inch stand-pipes and retorts 9 feet long. The necessary changes would have to be made in other cases.

Process of Putting Into Service Full Depth Recuperative Retort

43. It is desired to put into service a full depth recuperative retort bench that has been let down. Describe the process up to and including the drawing of the first charge burned off.

Ans. Draw the old coke from the retorts. Patch the retorts if necessary. Clean out furnace and flues. Close tightly all secondary air-flues and sight holes. Open primary air-flues. Start a small coke fire on the grate. Replace bridge-pipe covers. Gradually increase the fire as the bench heats. Have the clinkering door partly open, that air may enter above the fire and burn the carbon monoxide within the furnace. Gradually incrrease the fire, and the opening of the main damper, until the combustion chamber and lower retorts are at a dull red heat. Then fill the furnace, close the door, turn water on the water grate, and watch for the appearance of a blue flame at the openings leading from the furnace to the combustion chamber. When this appears, open the secondary air-flues gradually until the flame has shortened, and almost disappeared. The setting will now safely and rapidly come to a working heat. Charge the retorts as soon as they are all at a dull red. Draw the first charge when it is burned out. Begin regular charges when the retort is at a proper working heat. Close the main damper as the heat increases.

Putting Into Operation Bench of Retorts Heated by Generator Furnace

44. Describe the putting into operation of a bench of retorts heated by a generator furnace, from the lighting of the fire to the putting in of the first charge, giving the precautions to be taken to prevent any injury to the setting.

Ans. The method to be employed in putting into operation a bench of retorts heated by a generator furnace will depend somewhat upon whether the bench has just been built or reset, or is one that has been previously fired up and let down.

In the case of a new bench, or of one that has just been reset, it is necessary that all the brick work about the bench should be thoroughly dried, by being subjected to a low heat for a long time, before any attempt is made to heat it up to a working point. This drying cannot be hurried without injury to the

bench, and at least two weeks should be allowed for it. It is effected by keeping a very low fire on the grate of the furnace, using about two or three bushels of coke at the start and keeping the fire about the same size afterwards. The clinkering door of the furnace should be left wide open, the object being to pass through the bench as much moderately warm air as possible, so as to pick up and carry off the moisture. The primary and secondary air ports should be closed, and also the main dampers. When the fire is first made all the stoppers in the front wall of the setting should be removed, leaving the stopper holes open. An opening the size of one or two bricks header-wise should also have been left in this wall directly under the crown of the arch. As the main dampers are closed the warm air, laden with the moisture picked up in the furnace and the lower part of the setting, escapes through these openings in the front wall, carrying the moisture with it, while if it had to pass all around the retorts and through the take-off flues it would become cool and deposit most of the moisture in these flues before it escaped to the chimney. After the furnace is dried the stoppers can be put in the lower openings and the warm air forced to travel farther along, and so on, until after a week or ten days the main dampers can be opened a little, the large opening under the crown of the arch closed up and the warm and now comparatively dry air drawn through the whole of the setting and the take-off flues, thus drying all portions of the bench.

After the drying out is completed the bench is brought up to working heat in exactly the same manner as a bench that has been let down after a certain amount of service, except that a new bench should be heated up a little more slowly than an old one.

The Heating Up Process

For heating up, a slightly larger fire is built than is used for drying out. Either just before or immediately after this fire is started, any coke left in the retorts from previous working must be drawn, the retort mouthpieces closed, the secondary air ports closed, and all stopper openings and cracks in the brick work carefully plastered up so that no air can get into the bench except through the primary air flues and the clinkering door. The primary air ports are opened slightly, as are also the main dampers. The clinkering door, instead of being left wide open, as in drying out, is only left slightly ajar, since now the object is to have the fire heat the bench and not to have it heat an excess of air passing through the bench. It is necessary to leave the door open a little to admit air above the surface of the fire for the purpose of consuming any carbon monoxide, CO, that may be formed, as soon as it escapes from the fuel, and thus prevent the formation of an explosive mixture of carbon monoxide and air in the upper part of the furnace and in the setting, since such a mixture if allowed to form would probably be ignited later and explode with more or less damage to the bench. It is also necessary that the surface of the fire should never be entirely covered with cold coke, some portion being always left hot and incandescent to ignite the carbon monoxide as soon as it meets the air.

Further Steps in the Process

The fire is gradually increased until at the end of from 48 to 96 hours it can no longer be fed through the clinkering door. The plates and water pan of the step grate are now put in, the clinkering door shut, the water started running on the grate, and the primary air ports and main dampers opened wider. The fire is fed through the filling door until the furnace is half full. If cold coke is used, the precaution noted above of never entirely covering the hot surface of the fire must be carefully observed. If hot coke is used, this, of course, obviates any danger of a cold surface to the fire. As soon as the combustion chamber and lower retorts reach a good red heat and the carbon monoxide coming from the furnace is seen to burn at the nostrils when air is admitted to the combustion chamber, the secondary air can be turned on and the bench brought up to heat as rapidly as is necessary, the furnace still being kept about half full of coke, being completely filled only a few hours before the bench is to be put in action.

As soon as the retorts reach a red heat they should be patched and charged with coal, the charge being left in until burnt out. The bridge pipe covers should, of course, be closed before the retorts are charged. When the bench is nearly up to the proper working heat, regular charging can begin, and when this heat is reached the openings of dampers and primary and secondary air ports must be carefully regulated to the proper respective areas.

If necessary an old bench can be put in action within sixty hours after the fire is first started, but it is best to proceed more slowly if possible and spend five or six days in bringing the heat to the working point.

Adjustment of Chimney Dampers and Primary and Secondary Air Slides

45. After having heated up and put into regular operation a bench of retorts, full depth recuperative setting, how would you proceed to adjust the chimney dampers and primary and secondary air slides in order to secure the greatest fuel economy?

Ans. When a bench of retorts with a full depth recuperative setting has been heated up to the required heat and put into regular operation the proper conditions for economical running are obtained as follows: The chimney dampers are pushed in, until, on opening the charging door of the furnace and throwing into the fire a handful of coal dust, the resulting flame plays lazily back and forth out of the door, being neither drawn steadily in by the draft nor forced out too vigorously by an excess of pressure. If the heat can be maintained with a slight pressure on the furnace great economy of fuel can be attained, but, as a rule, heats cannot be kept up unless the pressure is cut down practically to zero. There should never be a decided "pull" on the fur-

nace except on special occasions, when the heat has to be brought up quickly, without regard to the quantity of fuel used. The dampers set, the heat is brought to the proper point by increasing or decreasing the primary air opening, the secondary air being kept properly proportioned to the amount of carbon monoxide produced by the furnace. The proper amount of secondary air opening is determined by noting the disappearance in the take-off flue, or at any convenient point of observation in the waste gas flues of the recuperators where the heat is not too high, of the blue flame that indicates the escape of unconsumed carbon monoxide from the combustion chamber. If this flame is present the secondary air opening is gradually increased until the flame disappears, waiting a sufficient length of time after each slight increase of opening for the extra air to travel through the bench. When the flame is gone the adjustment is right and the secondary air slides should be clamped. If no flame is present and the adjustment has not been made for some time, the secondary air openings are decreased until the flame appears, and then the adjustment is made as above. As the quantity of carbon monoxide produced varies with the condition of the fire as to the amount of ashes, depth of fuel-bed, etc., the secondary air supply cannot be kept exactly right for every hour of the day, and this being so, enough is supplied to consume the average maximum production of carbon monoxide, since the loss of heat due to the small excess of secondary air, present when less carbon monoxide is made, is smaller than would be suffered by allowing an equal quantity of carbon monoxide to escape unconsumed, the loss of sensible heat being practically equal in both cases, while with the unconsumed carbon monoxide there is the additional loss of its heat-producing power. If there is sufficient recuperating surface in the bench, the appearance of any heat above a dark red in the recuperators below the point of entrance of the secondary air is an almost certain indication of an insufficient secondary air supply, even though no flame can be seen, the flame not being very marked in a highly heated space.

After this adjustment of the damper and air slides is made, they are fastened so securely that it is impossible for them to be removed unintentionally.

Importance of Adjustments for Recuperative Benches

Recuperative benches will not give the best results, nor the highest heats, unless the adjustments spoken of above are properly made, and the making of them should not be left entirely to the average retort house fireman, nor even to the average foreman, until he is taught enough of the principles of generator firing to have some insight into what he is trying to do. Even then regular investigation by the superintendent of the conditions of damper opening and air supply will tend to keep down the percentage of fuel used.

If the works is equipped with a gas analysis apparatus and an employee who is enough of a chemist to be able to obtain accurate results with this apparatus, the supply of secondary air can be regulated by means of analyses of the waste gases more closely than by the method described above. The latter will, however, give results that will be as good as, and probably even better than, those obtained from analyses that are improperly or carelessly made.

Operation of Bench of Coal Gas Retorts Heated by Recuperative Furnace

46. Describe the operation of a bench of coal gas retorts heated by a recuperative furnace, either half-depth or full-depth, including the care and operation of the furnace, stand-pipes and hydraulic main.

Ans. The first point to be noted in operating a recuperative bench is the regulation of the draft. The chimney dampers should be pushed in until on opening the charging door of the furnace and throwing into the fire a handful of coal dust, the resulting flame plays lazily back and forth out of the door, neither being drawn steadily in by the draft, nor burning up vigorously. The dampers set, the heat is regulated by increasing or decreasing the primary air opening, the secondary air being kept properly proportioned to the amount of carbon monoxide produced by the furnace. The chimney dampers will need readjustment, if the quontity of fuel consumed varies materially.

Secondary Air Adjustment

The proper amount of secondary air opening is determined by noting the disappearance in the take-off flue, or at any convenient point of observation in the waste gas flues of the recuperators, where the heat is not too high, of the blue flame that indicates the escape of unconsumed carbon monoxide from the combustion chamber. If this flame is present, the secondary air opening is gradually increased until the flame disappears, waiting a sufficient length of time after each slight increase of opening for the additional air to travel through the bench. When the flame is gone, the adjustment is right and the secondary air slides should be clamped. If no flame is present and the adjustment has not been made for some time, the secondary air openings are decreased until the flame appears, and then the adjustment is made as above. The quantity of carbon monoxide produced varies with the condition of the fire as to the amount of ashes, depth of fuel-bed, etc., so the secondary air supply cannot be kept exactly right for every hour of the day, and this being so, enough is supplied to consume the average maximum production of carbon monoxide, since the loss of heat due to the small excess of secondary air present when less carbon monoxide is made, is smaller than would be suffered by allowing an equal quantity of carbon monoxide to escape unconsumed; the loss of sensible heat being practically equal in both cases, while with the unconsumed carbon monoxide there is the additional loss of its heat-producing power. After this adjustment of the damper and air slides is made, they should be fastened so securely that it is impossible for them to be moved unintentionally.

It is necessary for the proper working of a gen-

erator furnace that the fuel-bed be kept deep and the depth be uniform throughout the furnace.

Cleaning the Fire

In cleaning the fire, there should be no work done from the top of the furnace, allowing a rush of cold air through the bench. All the work should be done through the cleaning door with a good bed of fuel left in the furnace to heat the excess of inflowing air. Secondary bars, resting on supports provided for the purpose, are driven in above the clinker line to hold up the fire; the grate bars are drawn, dropping the ashes into the pan; any hard clinker on the walls is cut away with chisel bars, the grate bars are replaced and the secondary bars withdrawn, thus letting the fire down upon the grate again. After taking out the ashes dropped into the pan during the cleaning of the fire, the dirt that has worked into the primary air openings should be raked out.

Every six weeks, or two months, the recuperator flues should be cleaned of the deposit of flue dust, as this interferes with the free transmission of heat through the walls to the secondary air. The primary air flues also need regular attention, the bursts of steam caused by the dropping of hot ashes and clinker into the water in the ash pan, when the fire is cleaned, carrying fine dust back into these flues beyond reach from the furnace.

Care of Stand-Pipes

Passing now to the care of the stand-pipes, these should be kept clean. The portion near the mouthpiece should be thoroughly cleaned each time the retort is drawn, and if choked so that the auger cannot be forced up at this time, should be augered after the charge has been in about an hour, when the obstruction will have been softened. The whole pipe should be cleaned every time the retort is scurfed, so as to allow the passage of a test ring one-quarter of an inch less in diameter than the pipe. The same course should be followed if the pipe stops up from any cause, the retort never being put back into action until a ring as above will pass down the full length of the pipe.

Unless means for removing the tar as it forms are provided it should be run off the hydraulic main at least twice in every twenty-four hours, and more often in case the main is small, to avoid any possibility of the dip pipes being sealed in tar. In case the tar becomes too thick to run through the take-off, it must be cleaned out through the cleaning holes with which the main should be provided. While running off the tar, care must be taken to maintain the seal on the dip pipes. Ordinarily the seal is maintained by the liquor condensed from the gas, and a suitable overflow must be provided at the right height to carry off this liquor.

"Letting Down" a Bench of Coal Gas Retorts Heated by a Recuperative Furnace

47. It is desired to "let down" a bench of coal gas retorts heated by a recuperative furnace. What is to be done in order that the bench may, with safety, be cooled down and kept idle until the increasing demand for gas, or other reasons, shall make it important to again fire it up? No repairs are to be made to the bench.

Ans. In letting down a bench of retorts with full depth recuperative setting, the last charge should be made as large as the retorts will hold. That is, if the charges are of four hours duration and the bench is to be let down at 7 o'clock, the charges from 3 o'clock on should be made to almost fill the retorts. The coke from these charges must not be drawn until the bench is cold. The furnace should be left half full of coke. When the last charge is put in, the primary air-slides should be shut down to within ½ inch of being closed, secondary air shut off entirely and dampers closed until there is just sufficient opening left to maintain a slight draft in the furnace. Two or three hours after the last charge is put in, the primary air ports should be closed entirely, all cracks around the brick work plastered up, so as to prevent the entrance of any air into the setting, the opening around the furnace charging door filled with coke dust or ashes to prevent any influx of air at that point, and the dampers practically closed, leaving them just cracked, so as to take off what little gas is still being generated in the furnace, but not enough to cause any draft through the bench. After the gas is all driven out of the coal in the retorts, the bridge pipe covers should be raised, so that in case there is any leakage of gas up the dip pipes through excess of pressure in the hydraulic main, it will escape through the open bridge pipes, instead of working down into the retorts and forming an explosive mixture which might be fired and damage the bench. After all these precautions have been taken, the bench must be allowed to cool down thoroughly, which it will do very slowly, before anything about it is opened for examination or for cleaning the furnace. If handled in this way, the cooling of the setting will be so gradual as not to cause any avoidable injury to retorts or blocks.

Causes of Stoppages in Coal Gas Stand Pipes

48. Give your theory of the causes of stoppages in the stand-pipes of coal gas retorts and the means you would employ to prevent them.

Ans. The causes commonly accepted as leading to excessive trouble from stoppages in the stand-pipes of coal gas retorts are:

1st. The subjection of the gas in the retort and stand-pipe to excessive pressure owing to the dip-pipes being sealed in tar, to the hydraulic main being choked with pitch, to the stand-ppes being too small originally or having been allowed to become partially filled up, or to the existence of obstructions in other parts of the apparatus which cause pressure to be thrown on the hydraulic main and consequently on the stand-pipe and retort.

2d. Irregularity in working owing to irregularity either in the heat of the retorts or in the weight of coal put into the retorts at successive charges.

(Eleventh Installment Next Week)

Timely Advertising

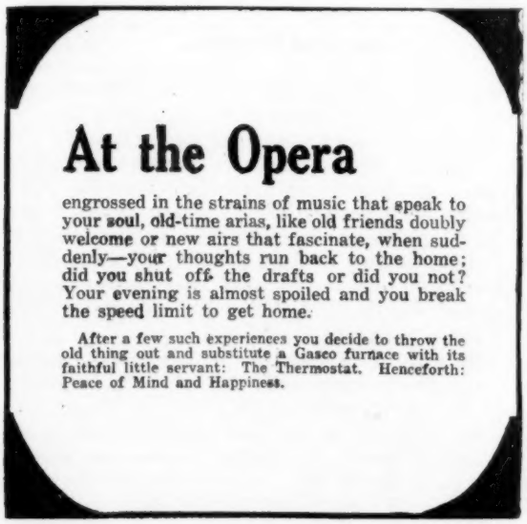
How some people take advantage of current events to make their ads effective

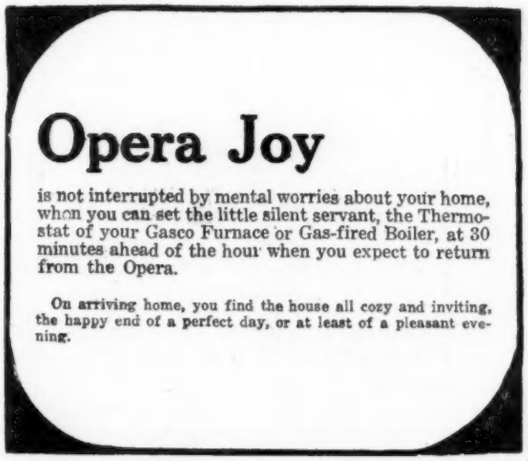
(By Special Correspondent)

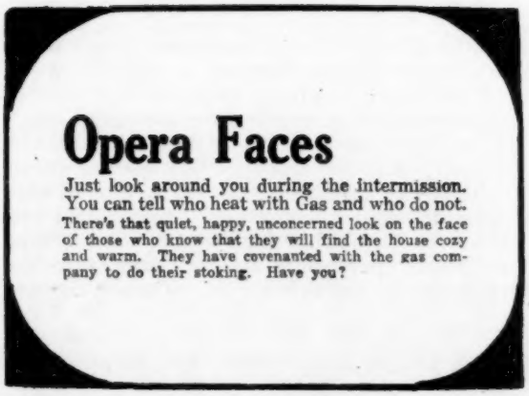
Your correspondent noticed in the papers that came to hand from Portland, Oregon, that while the Grand Opera was on the gas company was advertising in such a way that the people who were, of course, aware of the opera company being in town, would naturally have their attention attracted to the headline, which started with the word "Opera" in big type.

This plan could be easily followed by other gas and electric companies, not only when operas come to town, but whenever the public mind is concentrated on some particular happening.

The advertisements that were used in the Portland papers are shown below:


At the Opera
engrossed in the strains of music that speak to your soul, old-time arias, like old friends doubly welcome or new airs that fascinate, when suddenly—your thoughts run back to the home; did you shut off the drafts or did you not? Your evening is almost spoiled and you break the speed limit to get home.
After a few such experiences you decide to throw the old thing out and substitute a Gasco furnace with its faithful little servant: The Thermostat. Henceforth: Peace of Mind and Happiness.


Opera Joy
is not interrupted by mental worries about your home, when you can set the little silent servant, the Thermostat of your Gasco Furnace or Gas-fired Boiler, at 30 minutes ahead of the hour when you expect to return from the Opera.
On arriving home, you find the house all cozy and inviting, the happy end of a perfect day, or at least of a pleasant evening.


Opera Faces
Just look around you during the intermission. You can tell who heat with Gas and who do not.
There's that quiet, happy, unconcerned look on the face of those who know that they will find the house cozy and warm. They have covenanted with the gas company to do their stoking. Have you?

Opera Extremes
"Les Extremes se Touchent," says the French proverb. The originator might have thought of the two extremes felt by a man in evening dress—first "hearing things" from famous singers and then "saying things" on coming home to a cold house and having to build a fire in the furnace
All this is precluded when you heat with Gas.

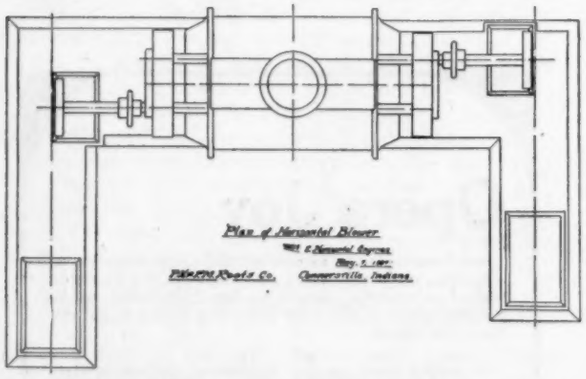
THE ROTARY HIGH PRESSURE BLOWER

(Continued from page 217)

each impeller and driven by a common cross-head. Due to the possibility of wear in these operating parts, the close clearances necessary for reasonable volumetric efficiency could not possibly be maintained.

Drives by Engines at Either End

A standard rotary unit is seen in Figure 1 having shafts extended, so that engines might be connected at each end. By extending opposite shafts at opposite ends, each engine was connected to its impeller, so that the load was fairly well divided between the two engines. It was hoped that this arrangement would result in relieving the timing gears of transmitting the full power load. By setting the engines



quarteringly, this scheme has some advantage in the fact that the unit can be started from any position without barring the engines off center. It is interesting to note that this scheme of drive has been advanced within recent years on large units.

This arrangement, however, has not found favor with engineers and operators, due to the complications necessary, and also due to the fact that the power delivered by each engine does not follow the power curve required by each impeller. This action results in a serious disadvantage in that the gears are called upon to take care of a variable load, which is more difficult to handle than a steady pulling load in one given direction.

Use of Electric Motor

With the development of the electric motor and the rapid spread of electricity as a means of power, we find that this type of prime mover has been largely applied to rotary pumping units. A few other styles of drive, such as gas engine and steam turbine, have been attempted, but few of these are in service. The necessity of making proper speed reductions and complications of drive, have been largely responsible for this result.

Reciprocating Steam Engine Most Popular

For driving gas pumps the reciprocating steam engine is by far the most popular type of prime mover. On the smaller units, the engine is usually of the vertical type, although on size 10x10 and larger we find a tendency toward horizontal units. The connection between prime mover and the rotary gas pump is effected by means of a direct coupling, either of the rigid flange type or of the flexible type. The latter is preferable. The flexible rope coupling is extensively used, because it corrects for misalignment in both the horizontal and vertical plane and in addition gives entire flexibility of connection.

By removing the ropes, either the prime mover or the rotary gas pump can be rotated without interference. The rigid coupling has been practically abandoned, due to the fact that with its use it is absolutely necessary to keep at least four bearings in perfect alignment, and, as a rule, bearings on engines of the smaller sizes are not regularly constructed of the adjustable type. This results in a gas pump with readily adjustable bearings being connected to an engine with non-adjustable bearings. The result, of course, cannot possibly be satisfactory.

Control of Pressure

With a prime mover capable of having a speed conveniently varied, the control of the pressure may be readily affected by a change in speed. Due to the fact that the gas blower is of the positive displacement type, a given volume is carried from the inlet to the outlet each revolution. The gas pump itself generates no pressure, but due to the fact that it passes a given volume of fluid per unit of time, pressure is developed by offering resistance to the flow of the fluid and naturally for a fixed resistance, the pressure varies with the speed.

When the gas pump is driven by a constant speed prime mover, the capacity sent out from the unit may be varied by the installation of a by-pass from the outlet to the inlet. This by-pass can be operated by hand for conditions of steady flow or for conditions of variable flow the by-pass valve may be automatically operated. A controller of the Huntoon type, consisting of a float operating in a tank, gives the highest degree of sensitiveness. When it is only desired to regulate within a few ounces, the by-pass valve can be operated from a diaphragm controller.

Method of Controlling Speed

In rotary units driven by variable speed prime movers, as has been previously stated, it is only necessary to control the speed to give a variation in pressure. The simplest method of controlling the speed is by hand, which can be used for steady flow rates. Where it is necessary for the speed of the unit to more closely follow the controlling pressure, it is necessary to provide automatic control. This control can be designed to operate through a throttling steam valve to regulate speed, or it may be designed to operate an adjustable cutoff device on the steam engine.

(The second article in this series will be published shortly)

Current Market Prices

COALS (By Courtesy of Coal Age)

A. Bituminous.

(Spot prices, F. O. B., mines, net tons).

High Volatile, Eastern	Market	Price
Pool 54-64		
(Gas Standard))	New York	$1.50 to $1.75
Pittsburgh screened gas	Pittsburgh	2.50 to 2.65
Pittsburgh gas, mine run	Pittsburgh	2.25 to 2.40
Kanawha lump	Columbus	2.50 to 2.75
Kanawha mine run	Columbus	1.50 to 1.75
West Virginia lump	Cincinnati	2.25 to 3.00
W. Virginia gas mine run	Cincinnati	1.50 to 1.65
Midwest		
Indiana 4th vein lump	Chicago	2.75 to 3.00
Indiana 4th vein mine run	Chicago	2.25 to 2.50
South and Southwest		
Big Seam lump	Birmingham	3.75 to 4.00
Big Seam mine run	Birmingham	1.75 to 1.85
Southeast Kentucky lump	Louisville	3.00 to 3.50
Southeast Kentucky mine run	Louisville	1.50 to 2.00

B. Anthracite.

(Spot prices F. O. B. mines, gross tons),

Market	Freight rates	Independent	Company
Egg New York	$2.34	$8.00 to $8.50	$8.75 to $9.25
Egg Philadelphia	2.39	8.50 to 10.00	8.75 to 9.25
Egg Chicago (net tons)	5.06	7.50 to 8.80	8.00 to 8.35

COKE (By Courtesy of Iron Trade Review).

Connellsville, furnace	$4.15 to $4.50
Wise County, furnace	4.50 to 5.75
Alabama, furnace	5.00 to 6.00
Foundry, Newark, N. J., del.	10.91
Foundry, Chicago, ovens	12.50
Foundry, Boston, delivered	12.50
Foundry, St. Louis	12.50
Foundry, Granite City, Ill.	12.50
Foundry, Alabama	5.00 to 6.50

PETROLEUM (By Courtesy of Oil, Paint & Drug Reporter)

(Prices at wells, per bbl.)

Pennsylvania—Ohio—West Virginia.	
Cabell, West Virginia	$2.05
Corning, Ohio	1.95
Lima	1.13
Pennsylvania	4.00 to 4.50
Wooster, Ohio	2.00
Indiana—Illinois.	
Illinois	1.92
Indiana	1.93
Oklahoma—Kansas.	
Healdton	.90
Mid-continent (low gravity)	1.00
Gulf Coast.	
Gulf Coast, Grade A	$1.65
Gulf Coast, Grade B	1.40

GAS OILS.

Gas Oil, Bayonne, bulk gal.	5½c
Gas Oil (32-36) Illinois-Indiana, gal.	5.88 to 6.13c
Gas Oil (32-36) Oklahoma, gal.	3¾ to 4 c
Gas Oil (32-36) Gulf Coast, gal.	4½ to 5 c

PIPE AND FITTINGS—CAST IRON GAS PIPE.

(By Courtesy Iron Trade Review.)

Four-inch, Chicago	$66.20 to $67.20
Six-inch and over, Chicago	62.20 to 63.20
Four-inch, Birmingham	57.00 to 58.00
Six-inch and over, Birmingham	53.00 to 54.00
Four-inch, New York	70.60 to 71.60
Six-inch and over, New York	65.60 to 66.60
Standard fittings, Birmingham, base	115.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20.

BY-PRODUCTS

(By Courtesy of Oil, Paint and Drug Reporter)

Ammonia aqua, 16 deg. drums lb.	5 to 5¼c
Ammonia aqua, 20 deg. drums lb.	6¼ to 6½c
Ammonia aqua, 26 deg. drums lb.	6¾ to 7 c
Ammonia squa, anhydrous cylinder, lb.	30 to 36 c
Ammonium sulphate, bulk F. O. B. Works, per 100 lbs.	$2.85 to $2.95
Potash prussiate, yellow casks, lb.	20 to 21 c
Potash prussiate, red casks, lb.	42 to 45 c
Soda prussiate, yellow casks, lb.	13 to 13½c
Soda sulphocyanide, barrels, lb.	45 to 55 c

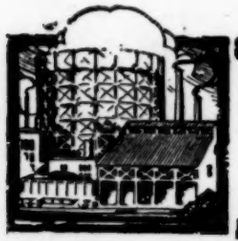
COAL TAR BASIC PRODUCTS.

(By Courtesy of Oil, Paint and Drug Reporter)

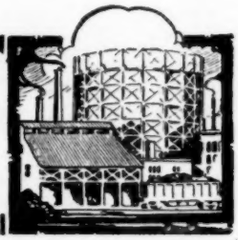
Benzol C. P. tanks, works, gal.	25 to 30c
Benzol, drums, gal.	30 to 35c
Benzol, 90% tanks, works, gal.	23 to 28c
Benzol, 90% drums, gal.	28 to 33c
Napthalene, flake, barrels, lb.	6¼ to 7c
Napthalene, crushed bags, lb.	5½ to 6c
Solvent Naphtha, water white works, gal.	28c
Solvent Naphtha, drums, works, gal.	33c
Solvent Naptha, Crude Tanks, works, gal.	25c
Solvent Naphtha, drums, works, gal.	30c
Toluene, C. P. tanks, works, gal.	31c
Toluene C. P. drums, works, gal.	36c

Caution prevails throughout the coal trade. Producers, dealers and consumers seem to be playing a waiting game—the objective not being clearly evident. The Government report of reserve stocks having revealed a goodly total, sufficient for more than immediate needs in most quarters, and the Jacksonville agreement having given an assurance of peace in the central competitive field for three years, the incentive to buy has been removed for the most consumers.

Production of crude petroleum is declining, but prices remain unchanged. Gas oils and the related furnace distillates are also fractionally cheaper. As the big demand in the markets of the above-mentioned sections has been for heating purposes, the tailing-off of cold weather has had the natural effect. This has been mitigated somewhat by the consuming demand incident to increased operations in cracking plants, but this latter influence has not got far enough under way to be a complete offset. Stocks of fuel and gas oils at the end of 1923 totaled 1,515,034,711 gallons.



NEWS OF THE GAS INDUSTRY



Elmira Water, Light & Railroad Co. Gives Series of Dinners to Employees

Tuesday evening, February 26, the Elmira Water, Light & Railroad Co., Elmira, N. Y., gave the first of a series of dinners to a group of employees, consisting of department heads and their assistants, and also some employees who come in constant contact with the public, such as telephone operators and complaint clerks. All departments were represented, gas, electric and street railway.

Mr. F. H. Hill, vice-president of the company, explains the objects of the dinner as follows:

"We feel that all employees, and particularly those who deal with our customers, should know much more about the company in general and about departments other than their own. This is particularly in view of the fact that we are a combination company and our customers seem to expect a gas man to know all about the electric and railway departments, etc.

"With this in mind and in order to get these employees better acquainted with one another, we began a series of dinners at which we will take up various features of our company's operation."

Sixty-seven employees attended the first dinner. The program for this occasion was as follows:

Introduction by Mr. F. H. Hill, vice-president and general manager, explaining object of dinner.

Explanation of the gas making process, by Mr. T. B. Williams, foreman of the gas plant. Mr. Williams explained in detail how they make and purify water gas and mix it with natural gas. He called attention to the fact that the gas plant is one of the most modern and efficient in the country, with all the latest improvements, including back runs, washer cooler, liquid purifier, recording calorimeter, grasshopper connection to relief holder, long distance pressure recorder, etc.

Report by Mr. H. L. Strong, superintendent of distribution, on work done in 1923 and planned in 1924. Mr. Strong explained numerous improvements made in the distribution system in 1923, and called attention to the large amount of prospective business through main extensions.

Brief explanation by Miss C. E. Lerch, supervisor of the New Home Economics Department, of what this department is doing.

Report by Mr. F. M. Houston, sales engineer, on what the sales department did in 1923 and expects to do in 1924, with reference to selling gas appliances and securing new gas customers.

Joseph A. Langelier Joins Eastern Service Co.'s Organization

Mr. Joseph A. Langelier, formerly with the Gas Co. at Nashua, N. H., and later with the Welsbach Co. of Providence, has joined the organization of the Eastern Service Co. at Boston, covering the New England territory on the lines which they represent. Mr. Langelier, therefore, becomes in a way the personal representative of the Kompak Company of New Brunswick, N. J., and his thorough knowledge of the Kompak Heater and his splendid ability as a salesman, are now at the disposal of the many companies who have already handled the Kompak Heater, or contemplate doing so.

Southern California Gas Company Issues Bonds

Los Angeles, Cal.—Public utility financing for California in 1924 has already made its appearance with an issue of $1,500,000 Southern California Gas Company first and refunding mortgage 6 per cent, series C, of 1858 gold bonds. The bonds, priced at 98 and accrued interest, redeemable at 105 and accrued interest, are offered by a syndicate composed of Pierce, Fair & Co., Blyth, Witter & Co. and Banks, Huntley & Co., Los Angeles.

The company, which serves artificial and natural gas in Los Angeles, San Bernardino and Riverside counties, supplies 30 per cent of the city's supply, exclusive of its wholesale deliveries to the Los Angeles Gas & Electric Corporation.

The first and refunding mortgage bonds are serured by a direct mortgage on all of the property of the company, subject to $9,886,000 first mortgage 6 per cent bonds, due 1950, of which 54 per cent have been deposited as security for the issue.

Net earnings for 12 months ended November 30 were 3.29 times interest on outstanding bonds, and for 10-year period ended November 30, 1923, net earnings increased 6.65 times, while interest charges increased but 3.4 times.

The principal franchises of the company are perpetual, the remainder extending beyond the maturity of this issue. First call is had on all natural gas over Midway Gas Company lines, the only company now transmitting natural gas into Los Angeles proper.

Expects Southern Meeting to Be Biggest in Its History

Reports from Augusta, Ga., indicate that the Southern Gas Association will have one of the biggest meetings in the history of the organization in that city on April 22, 23 and 24. The convention headquarters will be at the new Bon Air Vanderbilt, one of the finest winter hotels in the South. F. L. Marshall, general manager of the Gas Light Company of Augusta, informs us that reservations are being made daily by gas men from every section of the South.

Kings County Gas Offering Attractive Investment

The following item appeared in a recent issue of the Commercial Record:

The Commercial Record generally refrains from giving advice on investment matters, but every once in a while there is offered an issue which is so clearly a safe and attractive offering that it merits publicity. We refer to the 7 per cent cumulative preferred stock (series B) now offered by the Kings County Lighting Company of Brooklyn, with offices at 4802 New Utrecht avenue, 7212 Fifth avenue and 2024 86th street, Brooklyn, and 120 Broadway, New York City. A portion of this offering is for employees and consumers. The shares have a par value of $100 and are preferred as to assets and dividends, the latter being paid quarterly by check directly to stockholders. The issue is callable at 115 per cent and accrued dividends. The issue is offered for general subscription subject to prior offer to consumers.

The Kings County Lighting Company operates without competition under a perpetual franchise and free from burdensome conditions, in all or part of Bay Ridge, Fort Hamilton, Borough Park, Bensonhurst, Bath Beach, Blythebourne, Lefferts Park, Homewood, Mapleton, Midwood and Ulmer Park. These sections have had an extraordinary growth and with five rapid transit lines feeding it, real estate has advanced by leaps and bounds. In the past few years more than one hundred and fifty millions of dollars have been spent in these sections for improvements and the population has increased nearly 50 per cent. In the 225 miles of streets the company has 208 miles of mains and its business should show an amazing increase with the upward trend in population.

The plant of the Kings County Ligthing Company is up-to-date and modern in every respect, one of the best equipped lighting plants in the country and is located on valuable waterfront property in the borough of Brooklyn. In keeping with the advancement its executives are constantly enlarging its facilities and there is no limit to the possibilities of this great service business. That the gas service furnished by the company is satisfactory in every respect is indicated by the confidence in this section of Brooklyn shown by real estate interests, builders and loaning institutions. No better opportunity for safe investment has been offered the public in a long time and there is little doubt but that the stock will be oversubscribed when the books are finally closed. Subscriptions are taken in two ways, either for full payment at time of subscription or by payment of $10 or multiples thereof per share monthly until full amount is paid. Interest is paid on installments in this latter plan at the rate of 6 per cent and on cash purchase interest is paid at the rate of 7 per cent.

A good, safe 7% investment is desirable at all times. When a company with the resources, reputation and service giving qualities of the Kings County Lighting Company provides an opportunity for such an investment, only the most short-sighted person would hesitate to get aboard and share in the earnings and future possibilities. Probably many people, through the medium of this preferred stock, will lay the foundation of future security.

To Issue Stock

Topeka, Kan.—The Kansas Public Utilities Commission issued an order authorizing the Capital Gas & Electric Company to issue five thousand shares of preferred stock, $1,400,000 in bonds and ten thousand shares of no-par value common stock for the purchase and improvements on the property of the Consumers Light, Heat and Power Company. The new corporation is a Doherty company and has purchased the Topeka Gas Distributing System.

The price paid for the property was approximately $700,000. The company pays taxes on a little over 1 million dollars' valuation and the book value of the company is slightly over 2 million dollars.

The Capital Gas & Electric has a capitalization of 3½ million dollars under its charter, but not all of the capital stock will be issued.

Date Set for Pacific Coast Gas Association Meeting

Announcement has been made by Wm. Henderson, secretary of the Pacific Coast Gas Association, that the 1924 convention will be held at Santa Barbara, Cal., on September 16 to 19, inclusive.

New Water Gas Apparatus to Be Installed

The Gas Machinery Company of Cleveland, Ohio, has been awarded contract for a new 5 ft. carburetted water gas apparatus to be erected in the works of the Rockland Light and Power Company of Nyack, N. Y.

The Gas Machinery Company furnished a water gas set at Nyack several years ago, and this new set is to adjoin the old installation in space originally provided for same.

The contract includes overhead operating floor, air and steam meters and operation from one central point to vicinity of the gauge board.

Increased Earnings for Toledo Edison Company

The pamphlet report of the Toledo Edison Company, one of the public utility subsidiaries of Cities Service Company, shows that in 1923 the company did the largest business in its history. Gross income was $3,083,442 and there was a balance of $1,132,974 available for dividends. After preferred dividends this was the equivalent of $5.97 a share on the $13,875,000 common stock outstanding. In 1923, $542,818, or the equivalent of $3.91 per share, was earned on the then outstanding common stock.

The report shows a heavy gain in the electric and gas departments of the company and satisfactory gains in other departments. In his remarks to stockholders, Frank R. Coates, president, says, in part, regarding the gas department:

New Company Organized to Manufacture Gas in Maine

The Electric Railway Securities Co., Portland, Me., has been organized to do a variety of things in the manufacturing line. They will manufacture and distribute gas to the community in general. The company has a capital stock of 90,000 shares without par value. Carl C. Jones, D. D. Campbell and William Shepherd Linnell, of Portland, are the principal stockholders.

To Change Location of Holder Now Under Construction in Omaha

On account of the injunction proceedings instituted against the city by certain property owners, the board of directors of the Metropolitan Utilities District of Omaha, Nebraska, by a vote of 5 to 1, decided to change the location of the 4,000,000 cu. ft. capacity four lift holder now under construction by the Stacey Manufacturing Company of Cincinnati, on 24th street, at the intersection of the U. P. and C. B. & Q. R. R. tracks, to 21st street, between Dorcas and Center streets.

The change of location will necessitate removing approximately 45,000 cubic yards of earth to make room for the new holder. The expense of excavating and installing the concrete foundation is estimated at $100,000.

The Stacey Manufacturing Company had all of their erection equipment placed, tank bottom assembled and were prepared to start riveting when they were instructed by the operating engineer of the Utilities District to suspend all operations. Three months is the estimated time required for the excavation and installation of the new foundation for the holder.

Panama Canal Purchases 1,000 Gas Stoves for Zone Employes

The Panama Canal recently purchased from the Panama-Colon Gas Company 1,000 gas ranges, which will be installed in the quarters of any employee of the Panama Canal or Panama Railroad upon the payment of a nominal fee to cover the cost of the removal of the old coal stove.

S. P. Vecker, vice-president of the Panama-Colon Gas Company, states that his company now has a gang of men staking out their proposed gas lines, and the installation of gas mains will begin at once. Mr. Vecker further states that he feels this purchase of gas ranges practically makes gas the official fuel of the Canal Zone, and that this decision has only come after an exhaustive series of tests extending over a period of two years, which resulted in bringing out forcibly the economy of gas, both in money and in labor.

In the district of Ancon, where the trial tests were conducted, the average monthly cost of gas, extending over a period of nineteen months, has been $5.13, and in the district of New Cristobel the average monthly cost has been $4.26 per consumer.

The Panama-Colon Gas Company uses both English and Spanish newspapers, as evidenced by the two advertisements on this page. The ranges selected were the Roper range, manufactured by the Geo. D. Roper Corp., Rockford, Ill.

HOUSEWIVES

— Of —

ANCON--BALBOA--CRISTOBAL

THE PANAMA CANAL HAS PURCHASED

1000

GAS RANGES LIKE THIS FOR

YOU

Roper No. 283 Standard Single Oven Range Equipped With White Enamel Door Panel, Enamel Burner Tray and Rust Proof Metal Linings.

Ask Your District Quartermaster How You Can Arrange To Exchange Your Present Old-Fashioned Stove For a Brand New Up-To-Date Gas Range.

"IF IT IS DONE WITH HEAT, YOU CAN DO IT BETTER WITH GAS."

PANAMA—COLON GAS COMPANY

At Your Service.

AMAS DE CASAS

— DE —

ANCON -- BALBOA -- CRISTOBAL

EL GOBIERNO DEL CANAL DE PANAMA HA COMPRADO

1000

Estufas de Gas como esta

PARA

Ustedes

Roper No. 283 con horno, forros inoxidables, plancha esmaltada en el frente y una bandeja de esmalte.

PREGUNTEN A SU COMISARIO ORDENADOR CUANDO PUEDEN USTEDES CAMBIAR SU ACTUAL ESTUFA DE ESTILO ANTIGUO POR UNA ESTUFA DE GAS MODERNA.

Todo lo que Ud. necesite hacer con calor lo puede hacer mejor con Gas.

PANAMA -- COLON GAS COMPANY

SIEMPRE A LAS ORDENES DEL PUBLICO.

A. Gordon King Addresses Public Service Commission at Tenth Anniversary

Speaking at the banquet given at Harrisburg, Pa., February 18, to celebrate the tenth anniversary of the Public Service Commission of the Commonwealth of Pennsylvania, A. Gordon King, service engineer of the American Gas Association, said:

"State regulation of public utilities is not yet fifty years old, but in less than half a century it has grown to such an extent that today there are in the United States, its possessions, and Canada, no less than fifty-seven public service and railroad commissions.

"In the United States alone there are, including the District of Columbia, forty-eight railroad and public service commissions, one in every state but Delaware, with jurisdiction extending over one or all of the basic utilities represented in the electric light and power companies, gas companies, street and interurban railways, auto buses, water companies and telephone and telegraph companies.

"The mere recital of such a list instantly visualizes that the conveniences of yesterday have become the necessities of today. These utilities—and the list is incomplete—represent an investment of more than twenty billions of dollars. They render continuous and essential service to millions. Regulatory control of such a stupendous industry is no light task and calls for judicial minds, courage and broad vision, together with competent technical staffs.

"The American Gas Association represents 90 per cent of the gas manufactured in this country and its member companies are under the regulatory control of forty commissions and about 140 commissioners, having partial or complete jurisdiction.

"Last year there was made and sold in the United States nearly 400 billion cubic feet of manufactured gas—an increase over previous years, and an increase that will greatly grow.

"The gradual but sure exhaustion of natural gas fields that will ultimately require auxiliary or complete substitution by manufactured gas, the necessary conservation of solid and liquid fuels, and the ever increasing demand for gas as an industrial fuel, together with the daily growing house-heating load, are problems the operators have to tackle, and in which the regulatory bodies are just as vitally interested.

"Equitable rates, reasonable and workable standards of service, as well as a proper return upon the fair value of the property devoted to the public service, are all necessary to attract new capital, essential not only to the development of a fast growing industry but to its actual continuance. Work of the National Association of Railway and Utilities Commissioners has done much to clarify the issues, a notable contribution being the Uniform System of Accounts."

Mr. King concluded by quoting from the 1923 Report of the Committee on Public Service Securities of the Investment Bankers' Association of America:

"When administered with the broadest powers and in a judicial manner, statewide regulation of public utilities has been conclusively proved to afford the best guarantees which investors can have for a maintenance of that integrity of investment necessary for a ready flow of money into the business. Where such conditions do not exist we find lack of development of the business or higher costs of money or both—conditions which adversely affect the costs of service to the consumer."

P. H. & F. G. Roots Co. Loses An Old Employee

The P. H. & F. M. Roots Co. have lost an old, valued employee who was in the employ of the company for 57 years. During this time he did not lose a day by illness. This is certainly a remarkable record.

The following resolution was adopted by the Board of Directors of the Company:

"Whereas, An all-wise Providence has removed Joseph Reinhart from our midst; and

"Whereas, Mr. Reinhart had spent fifty-seven years of his life in our employ; and

Wheres, This remarkable record of service was characterized by uncompromizing loyalty, efficiency that always meant the best that was in him, a manner that was marked by uniform cheerfulness, treatment of his fellows that was always without discrimination, an integrity that was never questioned, a consistent Christian gentleman, a simple, modest, quiet, steady influence in our industrial life. Therefore Be It

"Resolved, That The P. H. & F. M. Roots Co. and its employees do thus heartily testify to the sterling worth, character and influence of our fellow workman and that we will always profoundly respect his memory. Be it further

"Resolved, That a copy of these resolutions be sent to Mrs. Reinhart and that they be spread upon the minute records of our Corporation.

"By order of the Board of Directors and a unanimous vote of our employees.

"THE P. H. & F. M. ROOTS CO.,
"E. D. Johnston,
"President & Gen. Mgr."

Additional Gas Plant Facilities at New London, Conn.

The Connecticut Power Company is increasing its gas plant equipment at New London, Conn., by an additional gas holder of 1,000,000 cu. ft. capacity, two additional purifier boxes, a new coal handling system and a coke storage shed together with other miscellaneous improvements. Contract has been awarded to Stone & Webster, Inc., Boston, Mass., for the construction of the foundation for the gas holder, which will be supported on about 1,000 piles 40 ft. of more in length. A bulkhead will also be contsructed outside the present dock line to provide additional coal storage and yard facilities. Stone & Webster will supervise the erection of the gas holder and purifier boxes which will be supplied by the Stacey Manufacturing Company of Cincinnati. The purifier boxes are of the outdoor type, one being 12 ft. in diameter and 12 ft. high, and the other 20 ft. in diameter and 14 ft. high. The coke storage shed of 650 tons capacity will be of corrugated iron and concrete. The total estimated cost of this work is $260,000.

Gas Light Company, Augusta, Ga., Sold

The Augusta Chronicle of January 26 says: "Eastern Firms Buy Gas Light Company—Sale of Local Properties Announced Yesterday—F. L. Marshall, General Manager, to Remain in Charge."

The Gas Light Company of Augusta has been purchased jointly by three large eastern firms, it became known here yesterday. F. L. Marshall, at present general manager, will remain in charge, and there will be no changes in the personnel, it was learned officially, following the announcement of the sale.

The local gas properties were sold to the Southern Gas and Electric Power Corporation of Baltimore and Philadelphia; Hambleton & Co., investment brokers of Baltimore, and the United Chemical Industrial of Philadelphia. Representatives of the purchasers had been in the city for some time prior to the completion of the sale, examining the properties of the gas light company.

Mr. Marshall stated yesterday that there was no change in policy of the gas company to be announced at this time.

The Gas Light Company has been owned and operated by the Southern Gas and Electric Corp., Baltimore, for the past nine years. L. Irving Pollitt is vice-president and general manager of the company.

Contracts Awarded

The Gas Machinery Company of Cleveland, Ohio, has been awarded contracts for either new benches or bench refillings in the gas plants at Brockport, N. Y., Danville, Pa., Bloomsburg, Pa., Cambridge Mass., Canandaigua, N. Y.

These fillings are all with sectional retorts and settings such as now have been installed for about the last ten years.

The Cambridge benches are all through retorts, and the Canandaigua bench work consists of through retorts arranged for present stop end firing.

Standard Gas and Electric Company Retires $7,142,000 of Bonds and Notes

Announcement has been made by Standard Gas and Electric Company of the retirement soon of $7,142,000 of its outstanding funded debt. The company has called for payment on March 5, at a price of 105 and interest, its outstanding convertible secured 7 per cent gold bonds, due March 1, 1937, of which $3,000,000 were authorized originally and $1,962,400 are now outstanding. These bonds are convertible, at the option of the holders into the 8 per cent cumulative preferred stock, and such conversions may be made, on ten days written notice to the trustee, at any time prior to the redemption date.

The 7 per cent gold notes of the company, due April 1, 1925, of which there are $2,500,000 outstanding, also have been called for redemption on March 5. Payment will be made at 101 and interest. Holders, at their option, may present the notes at any time prior to the redemption date and receive payment at 101 and accrued interest to date of surrender.

The company has called for redemption on April 5, 1924, at 107½ and interest, its secured 7½ per cent sinking fund gold bonds, due September 1, 1941, of which $3,500,000 were authorized originally and $2,579,600 are now outstanding. Holders of the bonds, at their option, may present them at any time prior to the redemption date and receive payment at 107½ and accrued interest to date of surrender.

Company to Expend $80,000 on Improvements

La Salle, Ill.—An appropriation of $80,000 for the installation of a new water gas set and the laying of high pressure mains in La Salle has been provided by the Illinois Power & Light Corporation, it was divulged by William H. Schreiner, local manager, at a recent meeting of the City Council.

"After a conference with officials at the headquarters in Ottawa," he said, "I was informed that the sum of $50,000 is to be expended here for the purchase of a new water gas set, which will furnish a sufficient supply for the entire city."

Mr. Schreiner also advised the council that he had asked the officials of the corporations to appropriate $30,000 for new mains in the city.

When asked by Mayor Coleman how soon the work would be completed, Mr. Schreiner said that he expected the gas set would be in operation by July 1, but that the mains would not be fully laid until the latter part of the summer.

"We are contemplating a belt line around the cty," he said. "These will be high pressure mains which supply the northern part of town as adequately as other sections. Mains also will be laid on LaHarpe and Crosat streets to the northern district."

Hibbing Reduces Gas Rates

Hibbing, Minn.—Gas rates in Hibbing were reduced by the Water and Light Board, making the local rate next to Virginia, the lowest on the Mesaba range and lower than the majority of villages and cities in the state. The new rates effective now are: First 20,000 cubic feet, $1.40 per thousand; next 20,000 cubic feet, $1.30 per thousand; all over 40,000 cubic feet, $1.20 per thousand. The above rates are subject to a reduction of 10 cents per thousand cubic feet if the accounts are paid before the 12th day of the month during the month the gas is used. The Water and Light Board in arriving at its deductions took into consideration the price of gas in other localities, including Albert Lea, which charges $2 per thousand; Fairmont, which charges $2.10 per thousand; Rochester, $1.75 per thousand; Winona, $1.60 per thousand; and Virginia, $1.35 per thousand.

Peoples Gas Co. Hold Meeting

Marshfield, Wis.—At a meeting of the Peoples Gas Company, held in the community rooms of the First National Bank recently, R. C. Hastings, F. A. Noll and Louis Trossen were re-elected as directors to succeed themselves. The directors will meet soon to choose the officers for the year. Mr. Trossen, secretary, reported on the financial condition of the company. It indicated that the plant is in a position to pay dividends in the future. The work of the new manager, A. A. Zertler, has been very satisfactory up to the present time.